

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (Previously presented) A process for reforming an alcohol, the process comprising:

contacting a feed gas mixture comprising an alcohol with a reforming catalyst to produce a reforming product mixture comprising hydrogen, the reforming catalyst comprising a metal sponge supporting structure and a copper coating at least partially covering the surface of the metal sponge supporting structure, wherein the metal sponge supporting structure is prepared by a process comprising leaching aluminum from an alloy comprising aluminum and a base metal.

2. (Original) A process as set forth in claim 1, wherein the feed gas mixture comprises a primary alcohol selected from the group consisting of methanol, ethanol and mixtures thereof.

3. (Original) A process as set forth in claim 2, wherein the process further comprises introducing hydrogen from the reforming product mixture and oxygen into a fuel cell to produce electric power.

4. (Original) A process as set forth in claim 1, wherein the reforming catalyst has a surface area of from about 10 m²/g to about 100 m²/g as measured by the Brunauer-Emmett-Teller method.

5. (Original) A process as set forth in claim 4, wherein the reforming catalyst has a surface area of from about 25 m²/g to about 100 m²/g as measured by the Brunauer-Emmett-Teller method.

6. (Original) A process as set forth in claim 5, wherein the reforming catalyst has a surface area of from about 30 m²/g to about 80 m²/g as measured by the Brunauer-Emmett-Teller method.

7. (Original) A process as set forth in claim 1, wherein the reforming catalyst comprises at least about 10% by weight copper.

8. (Original) A process as set forth in claim 1, wherein the reforming catalyst comprises from about 10% to about 90% by weight copper.

9. (Original) A process as set forth in claim 1, wherein the metal sponge supporting structure of the reforming catalyst has a surface area of at least about 10 m²/g as measured by the Brunauer-Emmett-Teller method.

10. (Original) A process as set forth in claim 9, wherein the metal sponge supporting structure of the reforming catalyst has a surface area of at least about 50 m²/g as measured by the Brunauer-Emmett-Teller method.

11. (Original) A process as set forth in claim 10, wherein the metal sponge supporting structure of the reforming catalyst

has a surface area of at least about 70 m²/g as measured by the Brunauer-Emmett-Teller method.

12. (Original) A process as set forth in claim 9, wherein the metal sponge supporting structure comprises nickel.

13. (Original) A process as set forth in claim 12, wherein the metal sponge supporting structure comprises at least about 50% by weight nickel.

14. (Original) A process as set forth in claim 13, wherein the metal sponge supporting structure comprises at least about 85% by weight nickel.

15. (Original) A process as set forth in claim 12, wherein the reforming catalyst comprises from about 10% to about 80% by weight copper.

16. (Original) A process as set forth in claim 15, wherein the reforming catalyst comprises from about 20% to about 45% by weight copper.

17. (Original) A process as set forth in claim 12, wherein the reforming catalyst comprises from about 5 to about 100 μ mol/g of nickel at the surface of said catalyst.

18. (Original) A process as set forth in claim 17, wherein the reforming catalyst comprises from about 10 to about 80 μ mol/g of nickel at the surface of said catalyst.

19. (Original) A process as set forth in claim 18, wherein the reforming catalyst comprises from about 15 to about 75 $\mu\text{mol/g}$ of nickel at the surface of said catalyst.

20. (Original) A process as set forth in claim 12, wherein the feed gas mixture comprises a primary alcohol selected from the group consisting of methanol, ethanol and mixtures thereof.

21. (Original) A process as set forth in claim 12, wherein the process further comprises introducing hydrogen from the reforming product mixture and oxygen into a fuel cell to produce electric power.

22. (Original) A process as set forth in claim 1, wherein said feed gas mixture is contacted with said reforming catalyst at a temperature below about 400°C .

23. (Original) A process as set forth in claim 1, wherein said feed gas mixture is contacted with said reforming catalyst at a temperature of from about 200°C to about 375°C .

24. (Original) A process as set forth in claim 23, wherein said feed gas mixture is contacted with said reforming catalyst at a temperature of from about 250°C to about 325°C .

25. (Original) A process as set forth in claim 1, wherein the reforming catalyst is incorporated onto the surface of a pellet or a monolith substrate.

26. (Original) A process as set forth in claim 25, wherein the reforming catalyst comprises a nickel sponge supporting structure.

27. (Currently amended) A process for reforming ethanol, the process comprising contacting a feed gas mixture comprising ethanol with a reforming catalyst at a temperature below about 400°C to produce a reforming product mixture comprising hydrogen, said reforming catalyst comprising copper [[at]] on the surface of a metal supporting structure.

28. (Original) A process as set forth in claim 27, wherein said feed gas mixture is contacted with said reforming catalyst at a temperature of from about 250°C to about 300°C.

29. (Original) A process as set forth in claim 27, wherein the reforming catalyst has a thermal conductivity at 300K of at least about 50 W/m·K.

30. (Original) A process as set forth in claim 29, wherein the reforming catalyst has a thermal conductivity at 300K of at least about 70 W/m·K.

31. (Original) A process as set forth in claim 30, wherein the reforming catalyst has a thermal conductivity at 300K of at least about 90 W/m·K.

32. (Original) A process as set forth in claim 27, wherein the process further comprises introducing hydrogen from the reforming product mixture and oxygen into a fuel cell to produce electric power.

33. (Original) A process as set forth in claim 27, wherein the reforming catalyst has a surface area of from about 10 m²/g to about 100 m²/g as measured by the Brunauer-Emmett-Teller method.

34. (Original) A process as set forth in claim 33, wherein the reforming catalyst has a surface area of from about 25 m²/g to about 100 m²/g as measured by the Brunauer-Emmett-Teller method.

35. (Original) A process as set forth in claim 34, wherein the reforming catalyst has a surface area of from about 30 m²/g to about 80 m²/g as measured by the Brunauer-Emmett-Teller method.

36. (Original) A process as set forth in claim 27, wherein the reforming catalyst comprises at least about 10% by weight copper.

37. (Original) A process as set forth in claim 36, wherein the reforming catalyst comprises from about 10% to about 90% by weight copper.

38. (Original) A process as set forth in claim 27, wherein the metal supporting structure comprises a metal sponge.

39. (Original) A process as set forth in claim 38, wherein the metal sponge supporting structure of the reforming catalyst has a surface area of at least about 10 m²/g as measured by the Brunauer-Emmett-Teller method.

40. (Original) A process as set forth in claim 39, wherein the metal sponge supporting structure of the reforming catalyst has a surface area of at least about 50 m²/g as measured by the Brunauer-Emmett-Teller method.

41. (Original) A process as set forth in claim 40, wherein the metal sponge supporting structure of the reforming catalyst has a surface area of at least about 70 m²/g as measured by the Brunauer-Emmett-Teller method.

42. (Original) A process as set forth in claim 38, wherein the metal sponge supporting structure comprises nickel.

43. (Original) A process as set forth in claim 42, wherein the metal sponge supporting structure comprises at least about 50% by weight nickel.

44. (Original) A process as set forth in claim 43, wherein the metal sponge supporting structure comprises at least about 85% by weight nickel.

45. (Original) A process as set forth in claim 42, wherein the reforming catalyst comprises from about 10% to about 80% by weight copper.

46. (Original) A process as set forth in claim 45, wherein the reforming catalyst comprises from about 20% to about 45% by weight copper.

47. (Original) A process as set forth in claim 42, wherein the reforming catalyst comprises from about 5 to about 100 $\mu\text{mol/g}$ of nickel at the surface of said catalyst.

48. (Original) A process as set forth in claim 47, wherein the reforming catalyst comprises from about 10 to about 80 $\mu\text{mol/g}$ of nickel at the surface of said catalyst.

49. (Original) A process as set forth in claim 48, wherein the reforming catalyst comprises from about 15 to about 75 $\mu\text{mol/g}$ of nickel at the surface of said catalyst.

50. (Original) A process as set forth in claim 42, wherein the process further comprises introducing hydrogen from the reforming product mixture and oxygen into a fuel cell to produce electric power.

51. (Original) A process as set forth in claim 27, wherein the reforming catalyst is incorporated onto the surface of a pellet or a monolith substrate.

52. (Original) A process as set forth in claim 51, wherein the reforming catalyst comprises a nickel sponge supporting structure.

Claims 53 - 87 (Canceled).

88. (Previously presented) A process as set forth in claim 1 wherein preparation of the reforming catalyst comprises depositing copper onto the metal sponge supporting structure.

89. (Previously presented) A process as set forth in claim 88 wherein copper is deposited by a method comprising electrochemical displacement reaction between a metal of the metal sponge supporting structure and copper ions.

90. (Previously presented) A process as set forth in claim 88 wherein copper is deposited by a method comprising electroless plating of copper metal on the metal sponge supporting structure.

91. (Previously presented) A process as set forth in claim 1 wherein the base metal comprises copper and/or a non-copper metal selected from the group consisting of nickel, cobalt, zinc, silver, palladium, gold, tin, iron and mixtures thereof.

92. (Previously presented) A process as set forth in claim 91 wherein the base metal comprises copper and/or a non-copper metal selected from the group consisting of nickel, cobalt and mixtures thereof.

93. (Previously presented) A process as set forth in claim 92, wherein the base metal comprises nickel.

94. (Previously presented) A process as set forth in claim 20, wherein the feed gas mixture comprises ethanol.

95. (Currently amended) A process as set forth in claim [[22]] 94 wherein the reforming product mixture comprises methane.

96. (Previously presented) A process as set forth in claim 95 comprising feeding methane obtained in the reforming product mixture to an internal combustion engine.

97. (Previously presented) A process as set forth in claim 95 comprising feeding hydrogen obtained in the reforming product mixture to an internal combustion engine.

98. (Previously presented) A process as set forth in claim 27 wherein the reforming product mixture comprises methane.

99. (Previously presented) A process as set forth in claim 98 comprising feeding methane obtained in the reforming product mixture to an internal combustion engine.

100. (Previously presented) A process as set forth in claim 98 comprising feeding hydrogen obtained in the reforming product mixture to an internal combustion engine.

101. (Previously presented) A process as set forth in claim 38 wherein the metal sponge supporting structure is prepared by a process comprising leaching aluminum from an alloy comprising aluminum and a base metal.

102. (Previously presented) A process as set forth in claim 101 wherein the base metal comprises copper and/or a non-copper metal selected from the group consisting of nickel, cobalt, zinc, silver, palladium, gold, tin, iron and mixtures thereof.

103. (Previously presented) A process as set forth in claim 102 wherein the base metal comprises copper and/or a non-

copper metal selected from the group consisting of nickel, cobalt and mixtures thereof.

104. (Previously presented) A process as set forth in claim 103 wherein the base metal comprises nickel.

105. (Previously presented) A process as set forth in claim 38 wherein the reforming catalyst comprises a copper coating at least partially covering the surface of the metal sponge supporting structure.

106. (Previously presented) A process as set forth in claim 105 wherein preparation of the reforming catalyst comprises depositing copper onto the metal sponge supporting structure.

107. (Previously presented) A process as set forth in claim 106 wherein copper is deposited by a method comprising electrochemical displacement reaction between a metal of the metal sponge supporting structure and copper ions.

108. (Previously presented) A process as set forth in claim 106 wherein copper is deposited by a method comprising electroless plating of copper metal on the metal sponge supporting structure.

Claims 109 - 130 (Canceled).